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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,405	11/10/2005	Dinand Lamberts	016782-0340	3705

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EXAMINER
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ART UNIT	PAPER NUMBER
3748	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/553,405	LAMBERTS ET AL.	
	Examiner	Art Unit	
	DANIEL BERNSTEIN	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5,10-18,20-22 and 24-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,10-18,20-22 and 24-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 5, 10-18, 22 and 24-37 rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,428,312 Smelcer et al.

In regards to claims 1, 29-31, 34 and 35, Smelcer discloses a gas burner (gas burner 30, Fig. 10), comprising: a metal burner membrane (foraminous burner surface 32, Fig. 10, 32 can be made of stainless steel or other metal alloys, see Col. 7 lines 16-33) configured such that, during use, gas penetrates (fuel/gas penetrates metal mesh burner surface 32 and ignites on the outer surface of the mesh membrane burner surface 32 as indicated by flames 36) before being ignited and resulting in visible flames (flames 35) having a lower flame front (the burner surface 32 has an irregular shape comprising hills 38 and valleys 40 which cause the flames to have varying exit

velocities. Since the shape of the undulations of the burner surface are the same as the applicant, the flame pattern will be similar, having a smaller flame front at the bends, or hills 38, and a larger flame front towards the valleys 40 due to the density of the mesh and the size of the exit holes at the bends, see Fig. 10 and Col. 4 lines 25-40) where the gas initially ignites outside said membrane, wherein said membrane comprises a fabric comprising stainless steel (Smelcer does not specifically teach using stainless steel for the fabric, but there is mention of using other metal alloy meshes to construct the burner membrane, see obvious material choice rationale below) fibers,

wherein said membrane of the gas burner comprises a base section (valleys 40, see Fig. 10) having a smallest radius (the valleys 40 have some smallest radius of curvature) of curvature being Rbase, a closing section (hills 38), and a transition region (continuous region between the hills 38 and valleys 40) connecting said base section to said closing section, wherein said membrane is uninterrupted Fig. 10 shows that the membrane 32 is uninterrupted),

but fails to disclose that said transition region has a smallest radius of curvature rtransition being larger than or equal to 0.02 x Rbase and being smaller than or equal to 0.7 x Rbase.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to select stainless steel as the metal alloy for the burner mesh membrane of Smelcer. It is widely known in the art that metal mesh membranes can be constructed of stainless steel. Furthermore, Smelcer specifically states that the burner membrane can be constructed from other metal alloys. Therefore, it would have

been obvious to try stainless steel as an obvious design choice for the metal mesh membrane of Smelcer. Selecting stainless steel as the material for the metal mesh membrane would not have led one of ordinary skill in the art to undue experimentation or unexpected results at the time of the invention.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to optimize the range of the dimensions (see MPEP 2144.05 Optimization of Ranges) of the curvature of the metal mesh membrane of Smelcer for the purpose of optimizing the flame pattern of the burner. Smelcer teaches that it is well known to use undulations in the burner membrane to effect a velocity change on gases passing through the membrane which results in an uneven flame pattern on the surface of the membrane. Smelcer also teaches that the undulations are beneficial in reducing the noise of the burner. Therefore, it would have been obvious to one of ordinary skill in the art to design around and optimize the ratios and dimensions of the undulations in order to create a desired flame pattern on the surface of the burner with the beneficial result of reducing the noise of the burner.

In regards to claim 29, claim 29 is a method claim but contains the same subject matter as mapped out in the rejection of claim 1. The applicant is claiming the same subject matter as claim 1 in a method claim 29.

In regards to claim 5, Smelcer discloses that the membrane further comprises a foraminated plate, a foraminated sheet, or a deep drawn or stamped wire mesh for supporting said fabric (Smelcer discloses support surface 52, see Fig. 5, where the support surface 52 can be constructed as a stainless steel expanded metal sheet, Col.

5 lines 38-47).

In regards to claim 10, Smelcer discloses that the base section has a shape (base section or valley 40 has the shape of a conical surface of a frustum of a cone as shown in Fig. 5) of a conical surface of a frustum of a cone.

In regards to claim 11, Smelcer discloses that the base section has a cylindrical shape (the cross section of valley 40 has a cylindrical shape as shown in Fig. 5).

In regards to claims 12 and 17, Smelcer discloses that the transition region is part of a torus surface delimited by two planes perpendicular to an axis of symmetry of said torus surface (Smelcer shows the torus shape in Fig. 2C).

In regards to claim 13, Smelcer fails to disclose that the base section has a polygonal cross section, the comers of said cross section being rounded.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to change the shape of the burner membrane of Smelcer so that the base section has a polygonal cross section (see MPEP 2144.04). Changing the shape of an invention is obvious unless there is evidence that a particular configuration/shape is significant. In this case, the applicant has not provided any evidence that the claimed shape of a polygon is advantageous over the frustoconical configuration as taught by the prior art.

In regards to claim 14, Smelcer fails to disclose that said base section has a rectangular cross section, the comers of said cross section being rounded.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to change the shape of the burner membrane of Smelcer

so that the base section has a rectangular cross section (see MPEP 2144.04). Changing the shape of an invention is obvious unless there is evidence that a particular configuration/shape is significant. In this case, the applicant has not provided any evidence that the claimed shape of a rectangular is advantageous over the frustoconical configuration as taught by the prior art.

In regards to claim 15, Smelcer fails to disclose that the base section is a truncated pyramid, said pyramid having rounded edges.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to change the shape of the burner membrane of Smelcer so that the base section has a truncated pyramid cross section (see MPEP 2144.04). Changing the shape of an invention is obvious unless there is evidence that a particular configuration/shape is significant. In this case, the applicant has not provided any evidence that the claimed shape of a truncated pyramid is advantageous over the frustoconical configuration as taught by the prior art.

In regards to claim 16, Smelcer discloses that said closing section is a small inverted sphere cap such that a depression (Fig. 2C shows an inverted sphere cap with a depression at the center of the burner membrane) forms at a center of said burner membrane.

In regards to claim 18, Smelcer discloses that said transition region is in a form of a circular ridge (Fig. 10 shows that the transition region between the valleys 40 and the hills 38 are in the form of a circular ridge).

In regards to claim 22, Smelcer fails to disclose that the smallest radius of curvature Rbase of the base section and the smallest radius of curvature r-transition of the transition region follow the following relation: 0.02 × Rbase --- rtransition ~ 0.35 X Rbase.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to optimize the range of the smallest radius of curvature of Rbase and r-transition in order to achieve a desired flame pattern on the surface of the burner (see MPEP 2144.05 Optimization of Ranges). Optimizing the range of the radius of curvature for Rbase and r-transition would have been obvious to someone of ordinary skill in the art at the time of the invention. This type of optimization would not have led one of ordinary skill in the art to undue experimentation or unexpected results.

In regards to claim 24, Smelcer fails to disclose that the smallest radius of curvature Rbase of the base section and the smallest radius of curvature rtransition of the transition region follow the following relation: 0.09 × Rbase ~ rtransition 0.7 X Rbase.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to optimize the range of the smallest radius of curvature of Rbase and r-transition in order to achieve a desired flame pattern on the surface of the burner (see MPEP 2144.05 Optimization of Ranges). Optimizing the range of the radius of curvature for Rbase and r-transition would have been obvious to someone of ordinary skill in the art at the time of the invention. This type of optimization would not have led one of ordinary skill in the art to undue experimentation or unexpected results.

In regards to claim 25, Smelcer fails to disclose that the smallest radius of curvature Rbase of the base section and the smallest radius of curvature rtransition of the transition region follow the following relation: 0.18 × Rbase rtransition -~ 0.35 X Rbase.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to optimize the range of the smallest radius of curvature of Rbase and r-transition in order to achieve a desired flame pattern on the surface of the burner (see MPEP 2144.05 Optimization of Ranges). Optimizing the range of the radius of curvature for Rbase and r-transition would have been obvious to someone of ordinary skill in the art at the time of the invention. This type of optimization would not have led one of ordinary skill in the art to undue experimentation or unexpected results.

In regards to claim 26, Smelcer discloses that the smallest radius of curvature Rbase of the base section and the smallest radius of curvature rtransition of the transition region are determined from a side (the orientation of the viewer is inconsequential to optimizing the size/range of Rbase and rtransition, since the radius of curvature can be calculated from both sides of the membrane) of the membrane which faces the flames.

In regards to claims 27, 32 and 36, Smelcer discloses that base section and the transition region are configured such that gas speed through the transition region is lower compared to gas speed through the base section (Smelcer discloses that the undulations in the metal membrane cause the gases to exit the membrane at varying velocities, it would be inherent that a region where the mesh is least dense, i.e. the

transition region, the gas flowing through the larger holes would be slower than a region where the mesh fibers are more dense, i.e. the base section, where gas is flowing through a reduced area causing the gas to accelerate in the same way flow velocity is accelerated through a nozzle (convergence)).

In regards to claim 32, claim 32 is claiming the same subject matter as claim 27, but in a slightly different manner. The first section is the transition region of Smelcer and the second section is the base section of Smelcer. The gas speed going through the first section will inherently be smaller than gas speed going through the second section, see above.

In regards to claim 28, Smelcer fails to disclose that the membrane only has a single transition region connecting a single base section to a single closing section.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to change the shape and size of the metal mesh membrane of Smelcer so that the membrane only has a single transition region connecting a single base section to a single closing section (see MPEP 2144.04, Changes in Size and Shape). Scaling down the invention of Smelcer would have been obvious to one of ordinary skill in the art at the time of the invention for the purpose of making a smaller burner of the same type. Changing the size and shape of an invention is obvious unless there is evidence that a particular configuration/shape is significant. In this case, the applicant has not provided any evidence that the claimed size and shape of the mesh membrane has any non-obvious improvements over the prior art of record.

In regards to claims 33 and 37, Smelcer discloses that a distance between the lower flame front and the first section is smaller than a distance between the lower flame front and the second section (the flame front will be longer/higher in the base section, second section, due to the increased mass flow rate through the denser fibers in comparison to the less dense transition section).

4. Claim 3-4 and 20-21 rejected under 35 U.S.C. 103(a) as being unpatentable over Smelcer in view of US 6,065,963 to Dewaegheneire et al.

In regards to claim 3, Smelcer fails to disclose that the stainless steel fibers are arranged essentially parallel into bundles.

Dewaegheneire teaches a conical surface burner with a membrane (2, Fig. 1) that comprises stainless steel fibers that are arranged essentially parallel into bundles (Col. 2 lines 7-17).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to combine Smelcer with Dewaegheneire for the purpose of providing the burner of Smelcer with a perforated metal fabric membrane made out of stainless steel in which the stainless steel fibers where arranged essentially parallel into bundles. This would have been an obvious design choice, because there are only so many known methods of arranging stainless steal into bundles and a parallel configuration is well known to someone of ordinary skill in the art as evidenced by Dewaegheneire. Therefore, it would have been obvious to combine Smelcer with Dewaegheneire, because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

It also would have been obvious to combine Smelcer with Dewaegheneire in order to increase the strength and durability of the metal mesh fabric.

In regards to claim 4, Smelcer in view of Dewaegheneire discloses that the bundles are knitted or braided or woven (Dewaegheneire, Col. 1 lines 5-6).
In regards to claims 20 and 21, Smelcer discloses that the membrane further comprises a foraminated plate, a foraminated sheet, or a deep drawn or stamped wire mesh for supporting said fabric (Smelcer discloses support surface 52, see Fig. 5, where the support surface 52 can be constructed as a stainless steel expanded metal sheet, Col. 5 lines 38-47).

Response to Arguments

5. Applicant's arguments see pages 10-21, filed 04/04/2011, with respect to the primary reference of Saponara have been fully considered and are persuasive. The non-final rejection of 01/04/2011 has been withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL BERNSTEIN whose telephone number is (571)270-5803. The examiner can normally be reached on Monday-Friday 8:00 AM - 5:00 PM EDT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on 571-272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DAB

/Kenneth B Rinehart/
Supervisory Patent Examiner, Art Unit 3743